

1/9

Bhavnagarwala et al.
YOR920030289US1 (TAD) (8728-635)

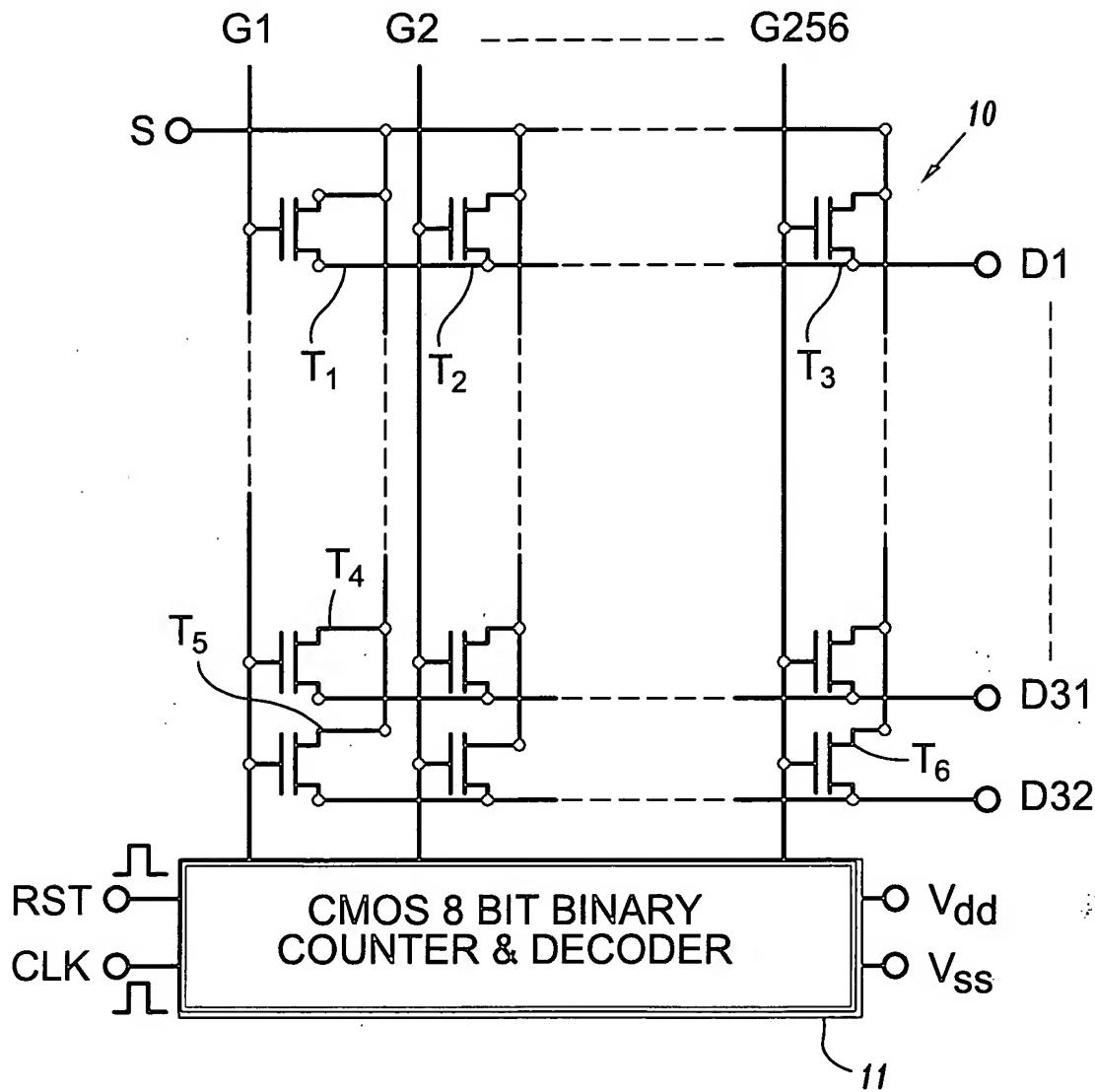
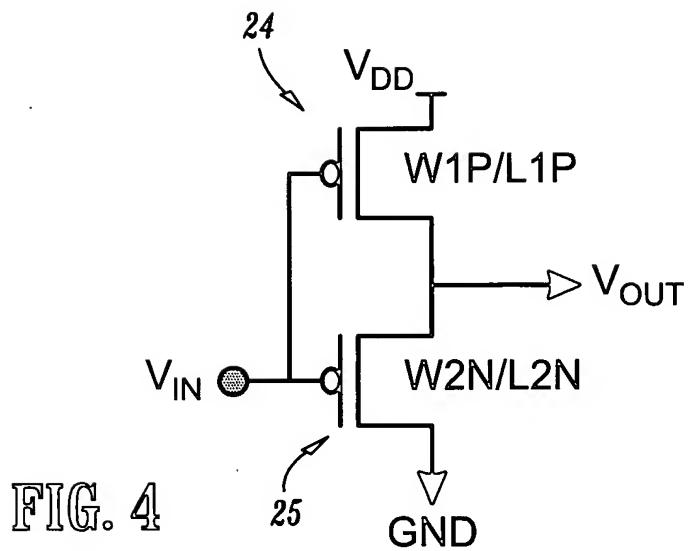
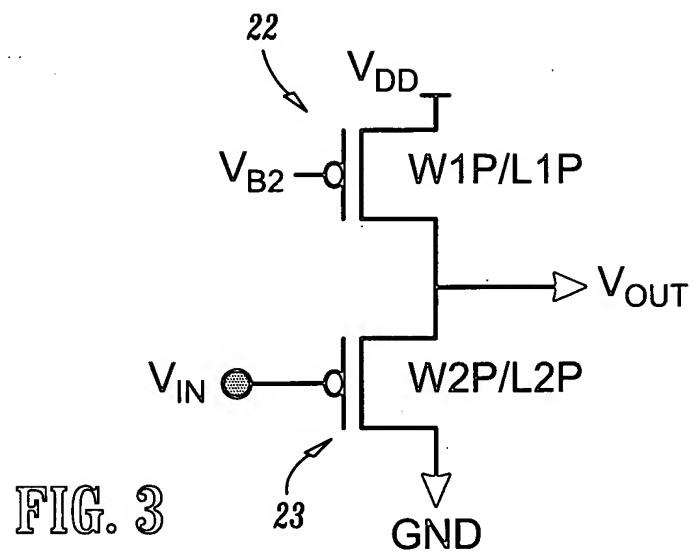
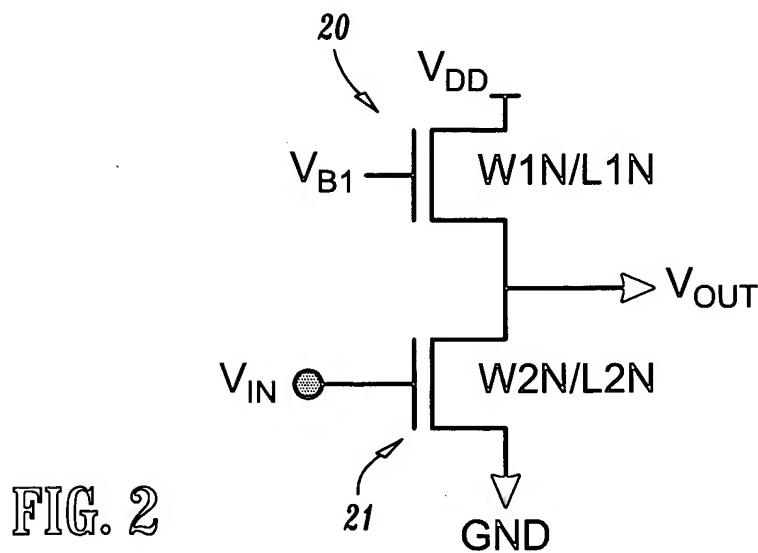


FIG. 1

(PRIOR ART)



$$V_{in} = V_{dd} - V_{out} + (V_{TN2} - V_{TN1}) +$$

$$\frac{\eta}{\beta} \ln \left| \frac{k_{N1}}{k_{N2}} \right| + \frac{\eta}{\beta} \ln \left| \frac{1 - e^{-\beta(V_{dd} - V_{out})}}{1 - e^{-\beta(V_{out})}} \right|$$

$$k_{N1} = \frac{W_{N1}}{L_{N1}} \mu_{on} C_{ox} \frac{\eta}{\beta^2} \quad k_{N2} = \frac{W_{N2}}{L_{N2}} \mu_{on} C_{ox} \frac{\eta}{\beta^2}$$

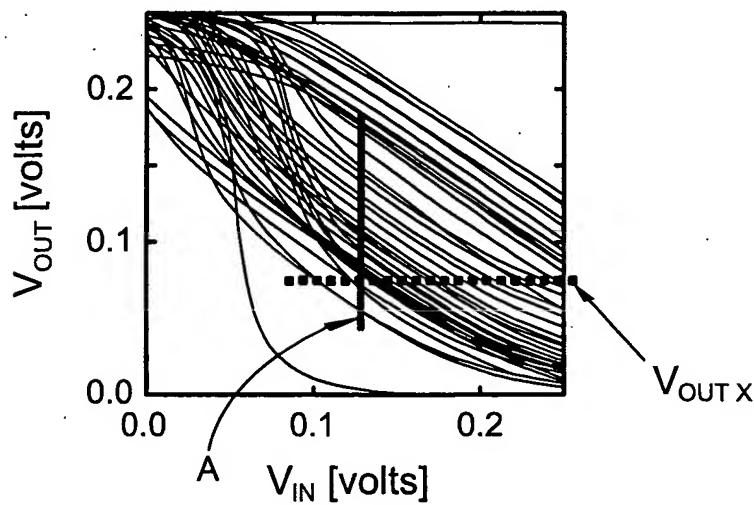
FIG. 5a**FIG. 5b**

FIG. 6

$$V_{in} = V_{out} - (V_{TP2} - V_{TP1}) -$$

$$\frac{\eta}{\beta} \ln \left| \frac{k_{P1}}{k_{P2}} \right| - \frac{\eta}{\beta} \ln \left| \frac{1 - e^{-\beta(V_{dd} - V_{out})}}{1 - e^{-\beta V_{out}}} \right|$$

$$k_{P1} = \frac{W_{P1}}{L_{P1}} \mu_{op} C_{ox} \frac{\eta}{\beta^2} \quad k_{P2} = \frac{W_{P2}}{L_{P2}} \mu_{op} C_{ox} \frac{\eta}{\beta^2}$$

FIG. 7a

$$V_{in} = \frac{V_{dd}}{2} - \frac{V_{tN1} - |V_{tP1}|}{2} +$$

$$\frac{\eta}{2\beta} \ln \left| \frac{k_{P1}}{k_{N1}} \right| + \frac{\eta}{2\beta} \ln \left| \frac{1 - e^{-\beta(V_{dd} - V_{out})}}{1 - e^{-\beta V_{out}}} \right|$$

$$k_{P1} = \frac{W_{P1}}{L_{P1}} \mu_{op} C_{ox} \frac{\eta}{\beta^2} \quad k_{N1} = \frac{W_{N1}}{L_{N1}} \mu_{on} C_{ox} \frac{\eta}{\beta^2}$$

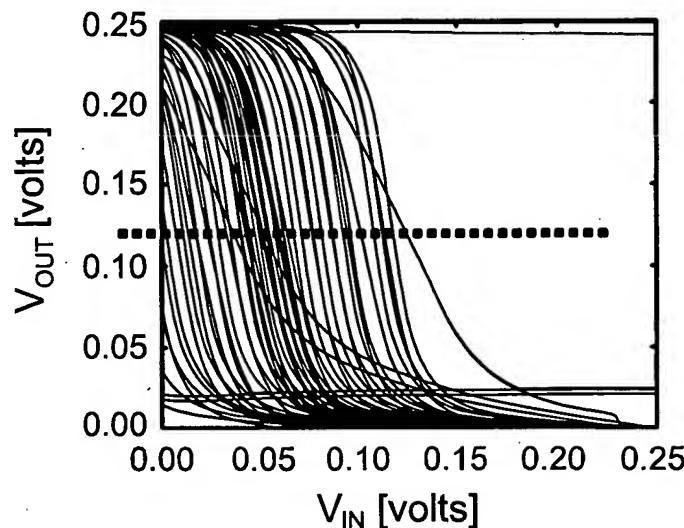


FIG. 7b

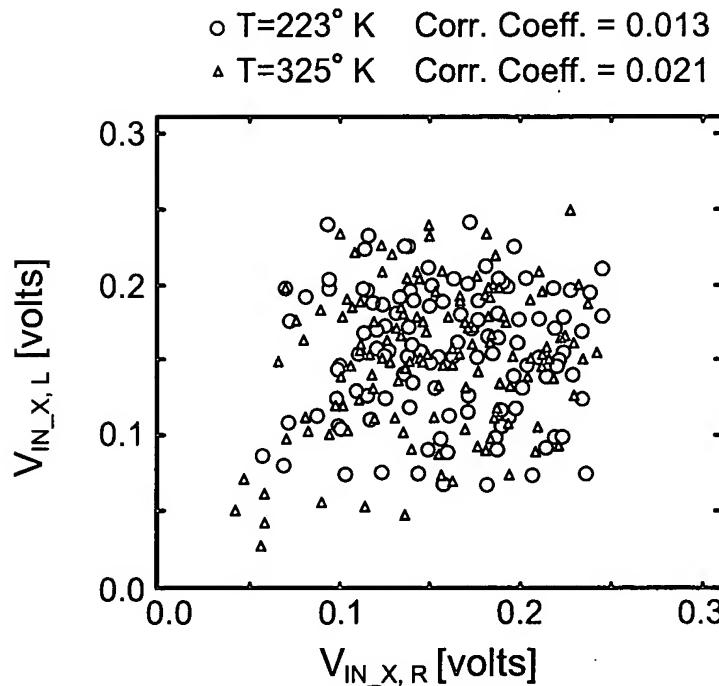


FIG. 8

- From Measurements, T=325°K, $\sigma V_T = 45.4\text{mV}$
- - - From Model, $\sigma V_T = 41.3\text{mV}$
- From Model, $\sigma V_T = 43.2\text{mV}$

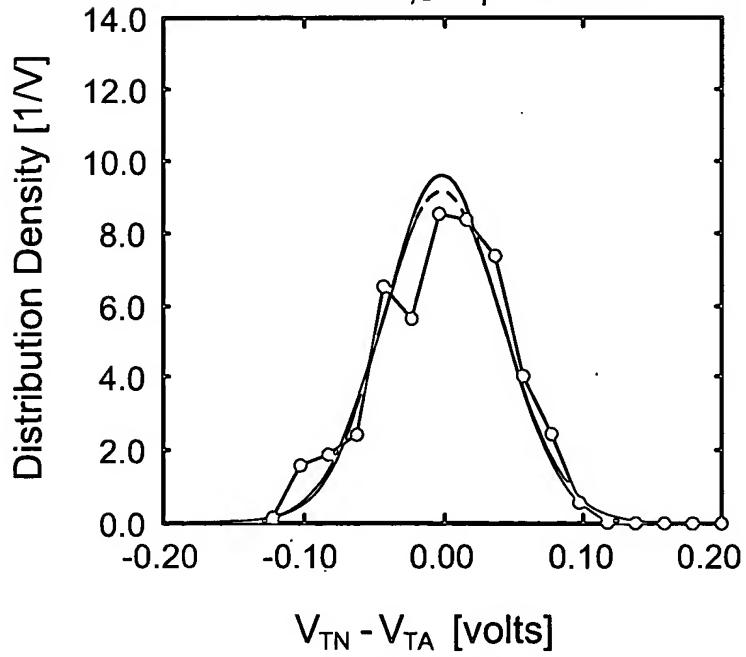


FIG. 9

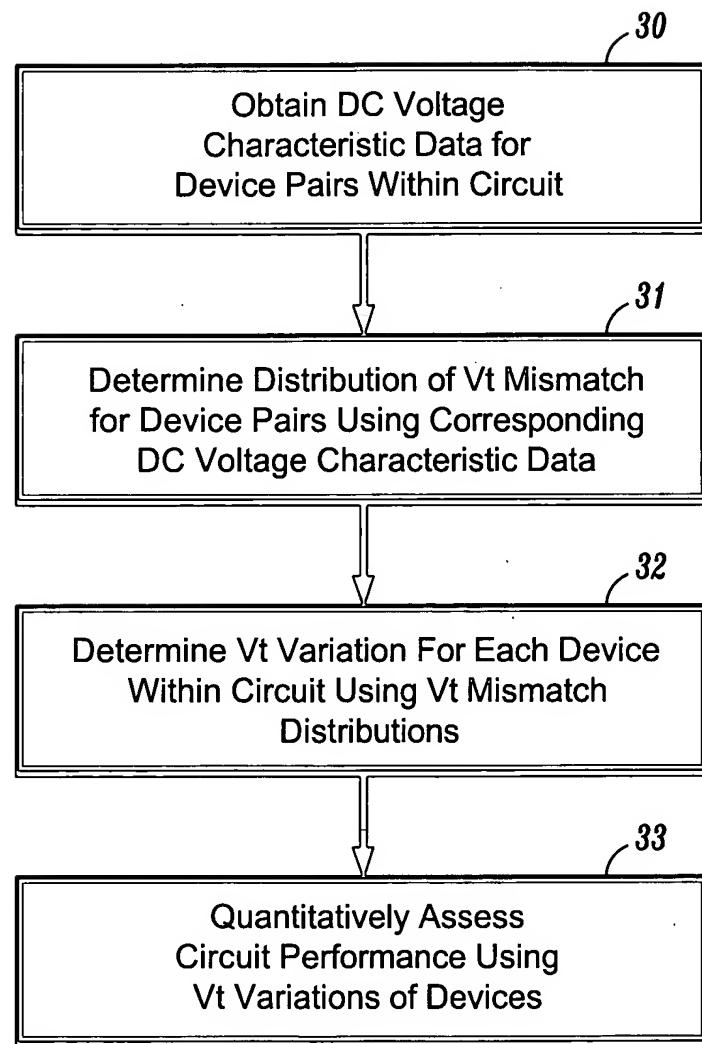


FIG. 10

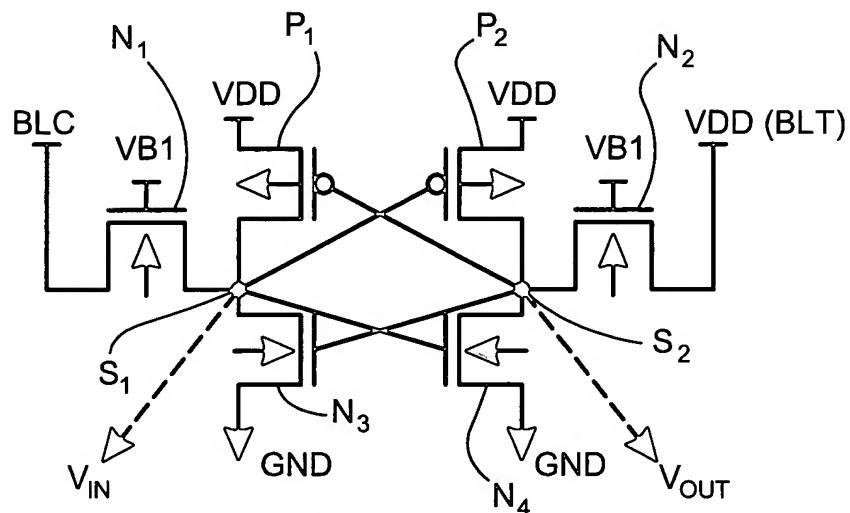


FIG. 11

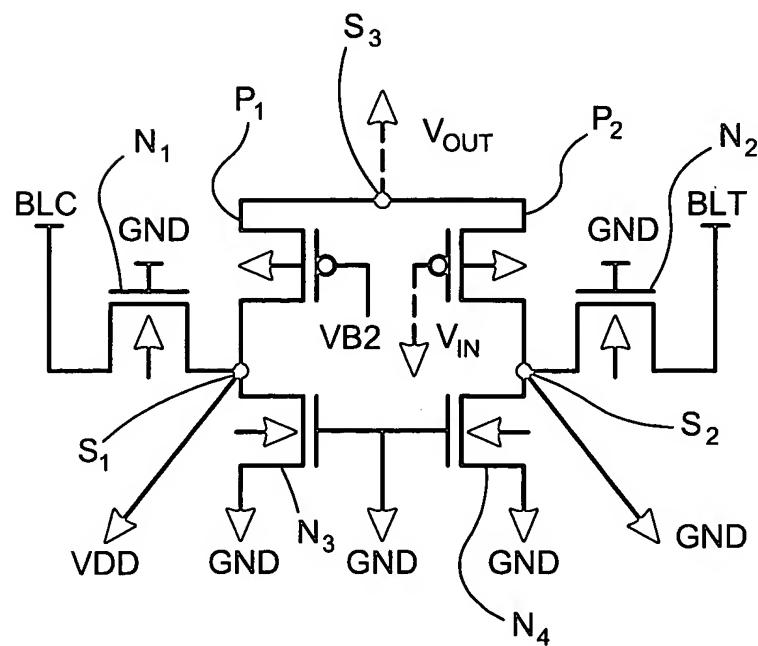


FIG. 12

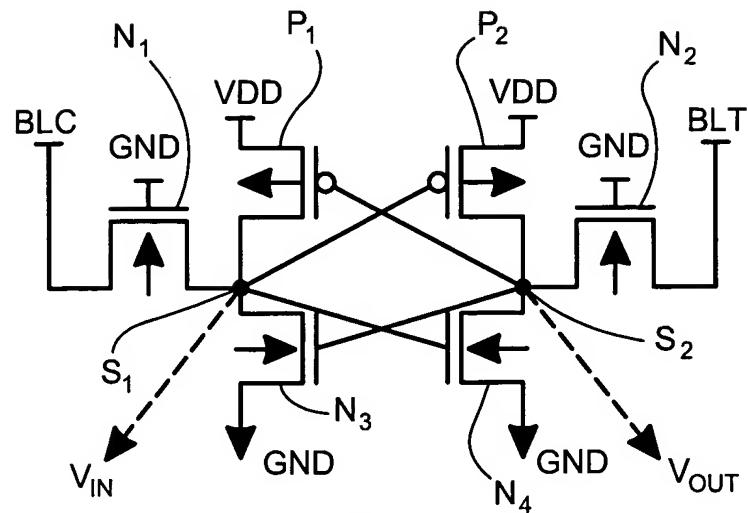


FIG. 13

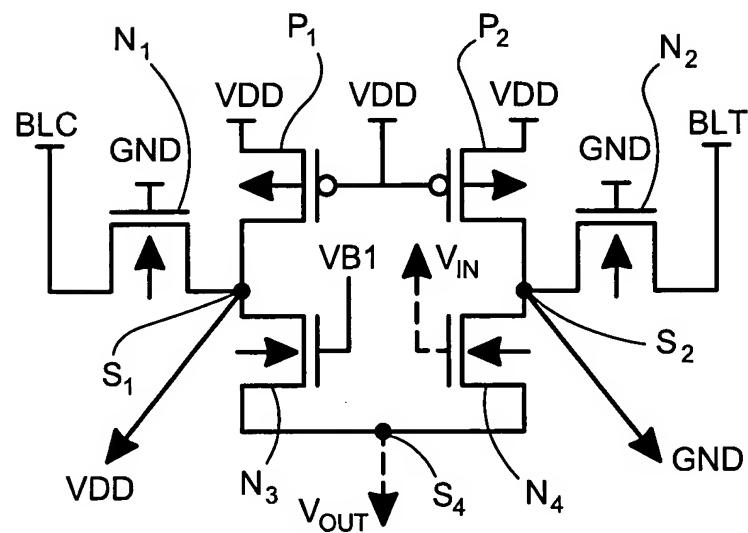


FIG. 14

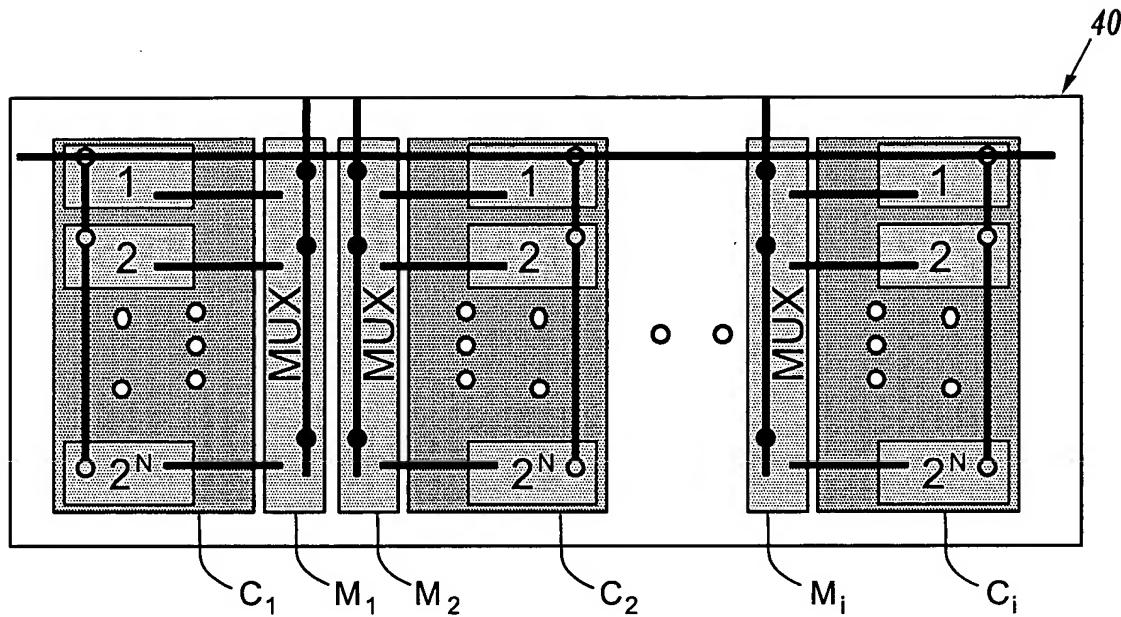


FIG. 15a

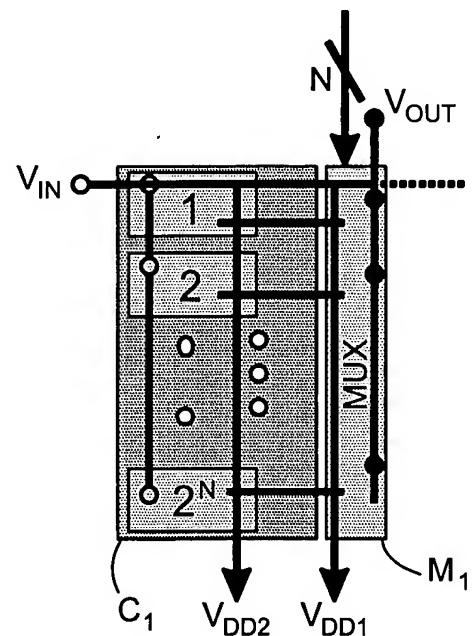


FIG. 15b